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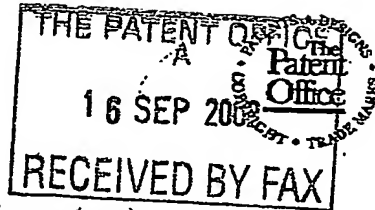
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1. Your reference

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2. Patent application number

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16 SEP 2002

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3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

05465486 001

Patents ADP number (*if you know it*)Infinite Data Storage Ltd
1 Pitreavie Court
South Pitreavie Business Park
Dunfermline
Fife KY11 8UG

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

4. Title of the invention

Direct connection of an optical data storage device and a consumer electronic device

5. Name of your agent (*if you have one*)"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)Kennedys Patent Agency Limited
Queen's House, Floor 5
19-29 St Vincent Place
Glasgow G1 2DTPatents ADP number (*if you know it*)

04973837002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country

Priority application number
(*if you know it*)Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (*Answer 'Yes' if:*

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

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Description 10

Claim(s) —

Abstract —

Drawing(s) 1 *only*

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Priority documents —

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Statement of inventorship and right to grant of a patent (Patents Form 7/77) —

Request for preliminary examination and search (Patents Form 9/77) —

Request for substantive examination (Patents Form 10/77) —

Any other documents (please specify) —

11.

I/We request the grant of a patent on the basis of this application.

Signature *Kennedy* Date

KENNEDYS PATENT AGENCY LIMITED 16.09.2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Jim Adams - 0141 226 6826

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Direct connection of an Optical Data Storage device and a
consumer electronic device

1

2 This invention relates to optical data storage in
3 particular interface control for optical storage device.

4

5 The storage of data files of all varieties on optical
6 storage medium currently requires the use of a personal
7 computer to control the interface between the storage
8 medium and the source of the data to be stored. The
9 present invention removes the requirement for the
10 personal computer.

11

12 The growth in digital consumer electronic devices over
13 the last 5 years has been explosive. Increasing features
14 available to the consumer has driven this growth. If the
15 example of digital still camera (DSC) is considered, the
16 consumer has been attracted by the ability to instantly
17 view, delete and in some cases modify the pictures they
18 have just taken, without the need for a "developing"
19 stage. The consumer can further produce "photo quality"
20 images with a low costs printer, connected to a personal
21 computer (PC). Recent developments have seen the

2

1 introduction of stand-alone printers, which can connect
2 directly to a DSC, or can have the flash media typically
3 used for the cameras connected directly to it. This
4 removes the requirement for a PC for the printing images.

5
6 Storage of the digital images produced is not done within
7 the DSC or the flash media used within these cameras, due
8 to the high costs, and limited size. Therefore the
9 digital images are typically transferred to a PC for
10 storage, which is ultimately in the form of optical data
11 storage in a typical application.

12
13 There are two major problems for owners of digital
14 cameras, namely the finite size and cost of proprietary
15 flash media cards that come with the digital cameras that
16 they buy, and the ease of sharing and displaying the
17 final images they have captured.

18
19 It would be advantageous to remove the need for a
20 personal computer to control the data transfer.

21
22 It is an object of the present invention to provide
23 direct connection of an Optical Data Storage device and a
24 consumer electronic device.

25
26 According to a first aspect of the present invention,
27 there is provided an optical storage device, adapted to
28 act as a "host" or master on a peripheral interface.

29
30 Preferably the optical data storage device comprises:

31
32 a data writing means (12) to write data to an
33 optical disc (13);

3

1 a peripheral interface (14) for data transfer to a
2 peripheral device (16); and
3 wherein the optical data storage device acts as the
4 "host".
5

6 Preferably the optical data storage device further
7 comprises a peripheral interface host module (18) for
8 providing host functions.
9

10 Preferably the host module is controlled by a firmware or
11 coding module (20).
12

13 Preferably the format of the peripheral interface is a
14 format for the transfer of data from peripheral device to
15 a PC.
16

17 Preferably the peripheral interface is the Universal
18 Serial Bus, version 1.1.
19

20 Alternatively the peripheral interface is a Universal
21 Serial Bus version 2.0.
22

23 Preferably the unit is powered from a battery supply
24 (26).
25

26 Alternatively the device is powered via the peripheral
27 connector (14).
28

29 Alternatively, the device is powered from a separate
30 supply (28).
31

32 Preferably the images are stored on the optical media in
33 a format conforming to the ISO9660 standard.

4

1
2 Preferably the images are decompressed and stored within
3 the drive memory (22), re-compressed into a standard
4 format (trans-coded).
5
6 Preferably the standard format is MPEG-1.
7
8 Preferably the trans-coded images are recorded onto the
9 optical media in a format where each still image is
10 written as a separate frame.
11
12 Most preferably the standard format is compatible with
13 the Video CD (or VCD) standard.
14
15 Preferably the peripheral device is a device which
16 transfers digital data to a PC.
17
18 Preferably the peripheral device is a Digital Still
19 Camera (DSC).
20
21 Preferably the peripheral device is a digital video
22 camera.
23
24 Preferably the peripheral device is a personal digital
25 assistant (PDA)
26
27 Preferably the peripheral device is a mobile phone.
28
29 Preferably the device is further adapted to transcode
30 data received by peer-peer transfer and produce optical
31 discs of standard format.
32

5

1 Preferably the device further comprises a transcoder
2 module (30) for converting data received from a
3 peripheral from a first format to a second format.

4

5 Preferably the device is adapted to save to a disc the
6 data received from a peripheral transcoded or copied
7 directly into a plurality of formats.

8

9 Preferably the discs are multi-session discs and
10 preferably each format is saved as a separate session.

11

12 In order to provide a better understanding of the present
13 invention, an embodiment will now be described by way of
14 example only and with reference to the accompanying
15 Figures, in which:

16

17 Figure 1 illustrates, in schematic form a device, in
18 accordance with a preferred embodiment of the present
19 invention.

20

21 The invention is an optical storage device which can act
22 as a "Host" or master device on a user interface (e.g.
23 Universal Serial Bus - USB). Once the device can act as
24 host, data files can be requested from the data source
25 (e.g. a digital camera or Personal Data Assistant - PDA),
26 and stored on the optical medium without the need for a
27 personal computer. This is known as peer-peer
28 communications.

29

30 The invention also includes a method of transcoding data
31 files received during peer-peer communications between an
32 optical data storage device and a consumer electronic
33 device, allowing the creation of an easily readable

6

1 standard format data disc. The data disc produced can be
2 in a number of formats. An example of an application is
3 the creation of a Video Disc (standard format from
4 Philips-Sony), or an ISO9660 disc which is again a
5 standard format. An additional example would be the
6 creation of a "multi-session" disc which had a session in
7 the Video Disc format, and a session in the ISO9660
8 format. This should allow maximum compatibility with
9 consumer electronic devices, such as DVD-Video players.

10

11 With reference to Figure 1, the optical data storage
12 device 10 is shown. The device comprises:

13 a data writing means (12) to write data to an
14 optical disc (13);
15 a peripheral interface (14) for data transfer to a
16 peripheral device (16); and
17 wherein the optical data storage device acts as the
18 "host".

19

20 The optical data storage device comprises a peripheral
21 interface host module (18) for providing host functions.
22 This is a USB Host IC. The host module is controlled by a
23 firmware stack or coding module (20). The format of the
24 peripheral interface is a format for the transfer of data
25 from peripheral device to a PC. The peripheral interface
26 is the Universal Serial Bus, version 1.1 or Universal
27 Serial Bus version 2.0, or FireWire IEEE 1394.

28

29 The unit is powered from a battery supply (26) or via the
30 peripheral connector (14) or from a separate supply (28).

31

32 The images are stored on the optical media in a format
33 conforming to the ISO9660 standard.

1
2 The images are decompressed and stored within the drive
3 memory (22), re-compressed into a standard format, MPEG-1
4 (trans-coded).
5
6 Alternatively, the images may be transferred directly to
7 the disc via the drive memory (22).
8
9 The trans-coded images are recorded onto the optical
10 media in a format where each still image is written as a
11 separate frame. The standard format is compatible with
12 the Video CD (or VCD) standard.
13
14 The peripheral device is a device which transfers digital
15 data to a PC, e.g. a Digital Still Camera (DSC), a
16 digital video camera, a personal digital assistant (PDA)
17 or a mobile phone.
18
19 The device is further adapted to transcode data received
20 by peer-peer transfer and produce optical discs of
21 standard format. For this, the device further comprises a
22 transcoder module (30) for converting data received from
23 a peripheral from a first format to a second format.
24
25 The device is adapted to save to a disc with the data
26 received from a peripheral transcoded or copied directly
27 into a plurality of formats. The discs may be multi-
28 session discs with each format is saved as a separate
29 session.
30
31 The preferred embodiment is portable CD-RW with image
32 download capability. The invention enables users to
33 connect any USB digital stills camera directly to

1 portable devices enabled with image download capability,
2 such as 12cm "Calypso" and 8cm "Samba" portable CDR and
3 CD-RW devices from Infinite Data Storage Ltd.,
4 Dunfermline, UK.

5

6 The present invention enables low cost CD storage and
7 file sharing for users on the move. On a family holiday,
8 there's no need to restrict the number of pictures you
9 keep.

10 Instead of using expensive replacement flash cards or
11 taking a laptop PC, you can burn as many as you like
12 directly from your digital camera to CDs that cost as
13 little as 50 cents each. You can use the CDs to archive
14 your photos, and what's more they can be format
15 compatible with your home DVD player, so you can simply
16 view your images direct on a TV. No more PC.

17

18 The digital image download technology enables consumers
19 with USB cameras to easily save images on very low cost
20 media that can be accessed on a variety of PC and non-PC
21 devices. Embedded image format conversion in the CD-RW
22 drive allows the creation of images on VCD or ISO 9660
23 compatible discs that can be played on any CD/DVD player.
24 In addition the inclusion of MultiPhotoVideo
25 compatibility further eases the accessing of pictures on
26 home DVD video players. Applications that are normally
27 only possible on PCs such as the mastering and burning of
28 CDs can be completed on an embedded processor (22) such
29 as the ARM7tdmi used in accordance with the present
30 invention.

31

1 Thus the present invention allows easy storage of data on
2 a standard optical storage medium without the need for a
3 personal computer.

4

5 The present invention allows the creation of standard
6 disc formats for data storage, without the need for a
7 personal computer.

8

9 The present invention allows the creation of multi-
10 session discs with the same data stored in different
11 formats to maximise compatibility.

12

13 One example of application is the backup of digital
14 images from a digital camera, whilst the user is
15 travelling or unable to access a personal computer.

16

17 This invention removes the need for the PC, and allows
18 creation of a copy and archival of the images produced
19 within the camera on an optical medium. Additionally the
20 images can be stored in different formats to allow easy
21 use and inter-changeability of the stored images. Typical
22 examples are storing the images in JPEG format (typical
23 format of images from a DSC) and ISO9660 standard file
24 structure. The ISO9660 standard allows easy interchange
25 between types of PC (e.g. Intel based and Apple
26 computers). Also provided according to the present
27 invention is the ability to convert between one image
28 encoding standard and another (trans-coding), for example
29 JPEG into an MPEG standard format, and the subsequent
30 creation and recording of the files in a Video CD (or
31 VCD) format/standard. The VCD format/standard allows the
32 still images to be viewed within for example a suitably

10

1 enabled DVD video player, thus removing the requirement
2 for the DSC owner to also own a PC.

3

4 The example given above is that for a DSC, but this could
5 equally apply to other CE devices, such as personal
6 digital assistants (PDA) or digital video cameras. Other
7 CE devices that also connect and transfer digital data,
8 images or audio could also be connected directly to such
9 an optical data storage device.

10

11 Further modifications and improvements may be added
12 without departing from the scope of the invention herein
13 described.

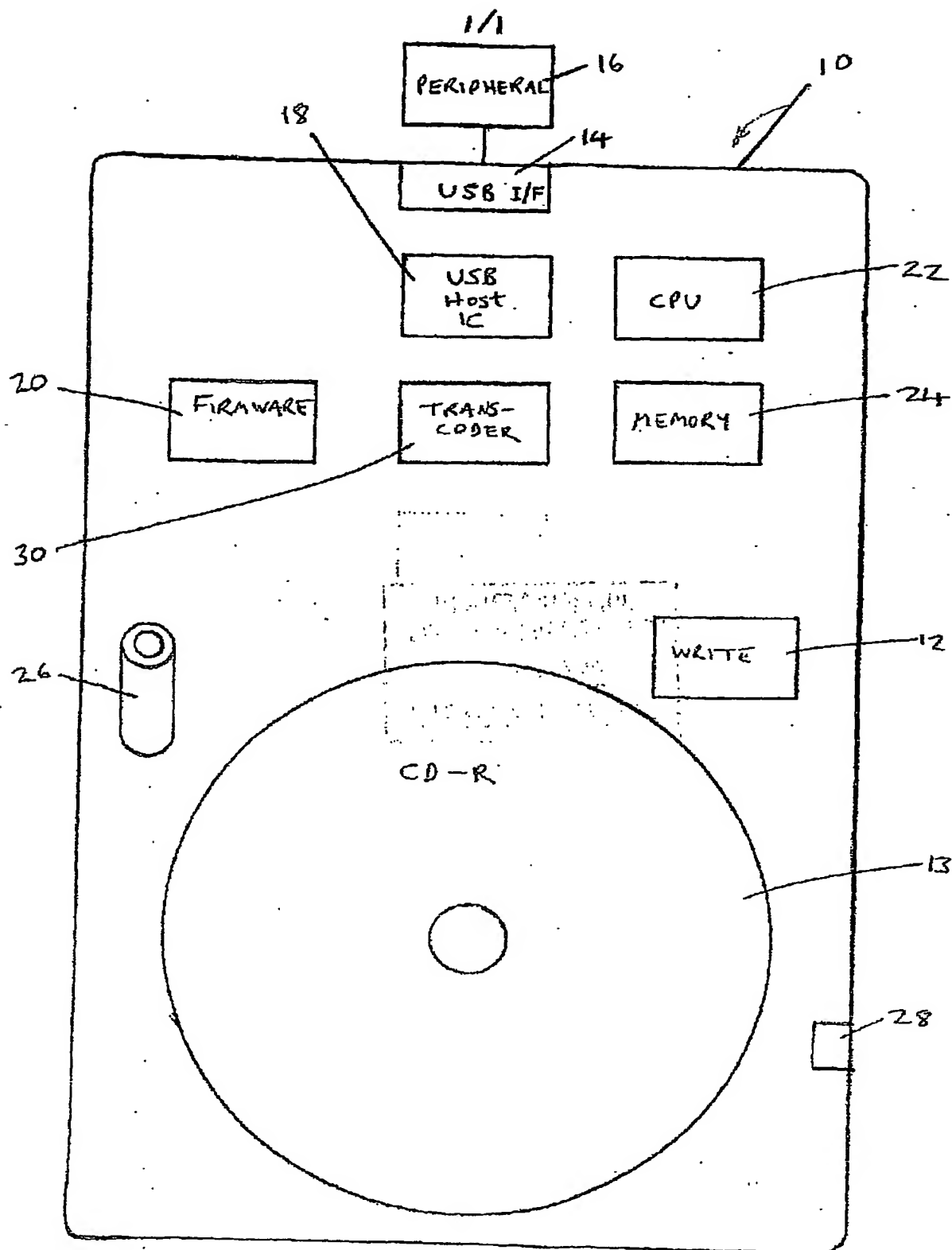


Fig. 1